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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,573	03/11/2004	Charles E. Taylor	SHPR-01360USP	6486

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EXAMINER	
OLSEN, LIN B	

ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
12/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,573	TAYLOR ET AL.	
	Examiner	Art Unit	
	LIN B. OLSEN	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *September 30, 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 24-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 24-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment and Arguments

Specification

The amendment to the specification has been entered. The objection to the specification has been withdrawn.

Applicant's arguments and amendments, see page 10, filed September 30, 2008 with respect to the rejection of Claims **1, 8, 15 and 24** under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements have been fully considered and are persuasive. The rejection of these claims for this reason has been withdrawn.

Applicant's arguments filed see page 10, filed September 30, 2008 with respect to the rejection of claims **1,8, 15, and 24** under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement have been fully considered but they are not persuasive. The applicant argues that the claims recite "an array of detectors" and the specification describes a "2D or two-dimensional array of detectors". The Applicants point out that a two-dimensional array of detectors is in fact an array of detectors. However, "an array of detectors" was introduced in the first amendment to the claims and is broader in scope that 2D detectors. An array of detectors encompasses a three- dimensional array of detectors as well as a two-dimensional array of detectors. The specification is consistent in describing a 2D array of detectors;

there is no description of utilizing a 3D array in the specification. Further, robots with sensors disposed around the periphery of the body of the robot (which can be interpreted as a three dimensional array) are well known in the art. Therefore the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's arguments with respect to claims **1, 3, 8, 10, 15 ,17, 24 and 26** under 35 USC 103(a) have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims **1, 8, 15 and 24** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims recite "an array of detectors" while the specification describes a 2D or two-dimensional array of detectors.

Claims **2-7, 9, 11-14, 16, 18-21 and 25, 27-31** are rejected for incorporating the above errors from the parent claims by dependency.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **1-2, 7-9, 14-16, 21, 24-26 and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,995,883 to Nishikado (Nishikado) in view of U.S. Patent No. 6,657,705 to Sano et al. (Sano) and PCT Printed Publication WO 91/13319 to Dunn (Dunn). Nishikado is concerned with an autonomous vehicle that incorporates a distance measuring sensor that measures a distance to an object. Sano is concerned with an optical distance measuring apparatus intended to be mounted on a moving vehicle that uses an array of sensors to detect the reflected light. Dunn is concerned with another optical distance measuring system using an infrared laser. Claims 8 and 24 are the method version of claims 1 and 15 and are rejectable for the same reasons as the system claims.

Regarding independent **claims 1, 8, 15 and 24** "A robot comprising:

a motion unit;

an array of detectors supported by the motion unit;" - Nishikado describes an autonomous vehicle (a robot) with a motion unit in col. 2 line 65 – 67. The vehicle supports a distance measuring sensor (1) that emits waves through ports 205. (col. 3 lines 8-12). Nishikado is not specific on the structure of the sensors, but Sano recites that the detectors (43 in Fig. 1) are in an array. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the known technique of Sano to improve the sensor of Nishikado so that it worked in the same way providing more detail of an obstacle.

"a memory device storing data corresponding to at least one counter configured to determine a time value associated with a detection of the array of detectors;" – Sano shows a time measuring circuit (61 of Figure 1) that is used to measure the time difference between the sending of a light pulse and the receipt of its reflection (col. 11, lines 26-28)

"an infrared sensor operatively coupled to the memory device, the infrared sensor including: (a) an infrared light source configured to produce a plurality of pulses of infrared light directed toward an environment of the robot; and (b) at least one optics configured to focus a plurality of reflections of the infrared light pulses from the environment of the robot to the array of detectors causing the detection of the array of detectors; and" - Sano describes the use of a laser diode as the light source ((col. 7, lines 49-54), but does not specify an infrared laser. Dunn describes a laser detection system for measuring distance that uses an infrared laser. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the

prior art elements of Sano's measuring system using an infrared laser as taught by Dunn as a combination of known prior art elements combined according to known methods that yield predictable results of the continued operation of the Sano method to measure distance. The light source (40 of Sano Fig. 1) produces a laser pulse beam (col. 7 line 58) and optics (41) focuses the reflections onto the array (43) of detectors.

"at least one processor operatively coupled to the memory device, the processor operable to determine distance information based at least in part on the determined time value." – In Sano, the memory is within the processor 33 and determines distance based on the input from the time measuring circuit (61) col. 12, lines 27-30.

Regarding **claims 2, 9, 16, 25 and 26**, which are dependent on claims 1, 8, 15, 24 and 24 respectively, where the determined distance information is produced by measuring a period of time to receive a reflected pulse and the at least one processor is operable to determine a feature of the environment based at least in part on the determined distance information. – The Nishikado/Sano/Dunn device as described with reference to claim 1, determines the distance by measuring the time to receive a reflected pulse. As Nishikado states in the abstract, the apparatus can be used to measure one or more dimensions of an object from which the light is reflected.

Regarding **claims 7, 14, 21, and 31**, which are dependent on claims 1, 8, 15 and 24 respectively, "wherein the robot is a robot cleaner." – In Nishikado, the autonomous device is identified performing cleaning of the floor (Col. 2, 65-67)

Claims 3-6, 10-13, 17-20, and 27-30 are dependent on rejected claims and are rejected at least for dependency on rejected claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 6,493,612 to Bisset et al. for an edge sensor for a robot floor cleaning device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIN B. OLSEN whose telephone number is (571)272-9754. The examiner can normally be reached on Mon - Fri, 8:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 571-272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin B Olsen/
Examiner, Art Unit 3661

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661